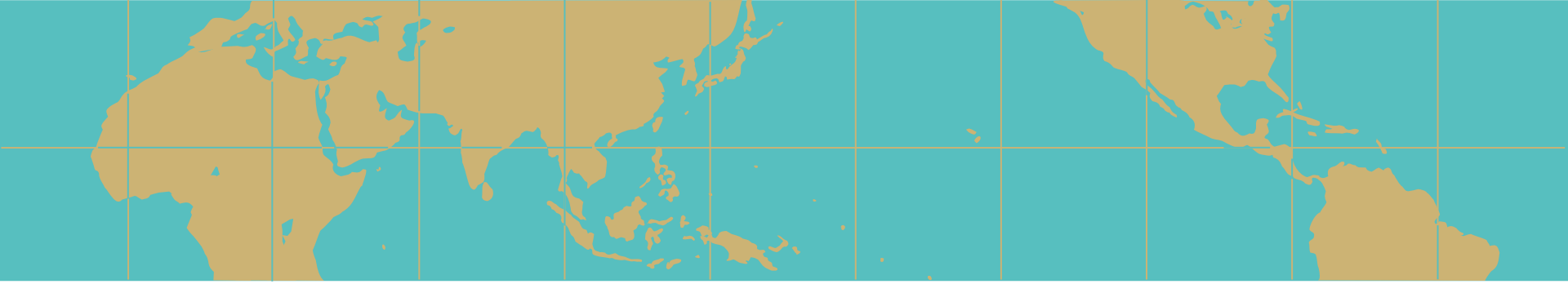
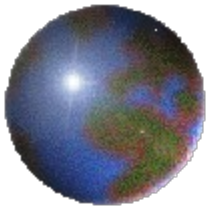




COTS Collaboration Tools

COTS Collaboration Vision: Then and Likely Future

George Edw. Seymour
Space & Naval Warfare Systems Center, San Diego

Enabling the Information Dominance Transformation

Via

COTS Collaboration Tools

A Presentation Scheduled for the Department of Defense Human Factors Engineering Technical

CAUTION

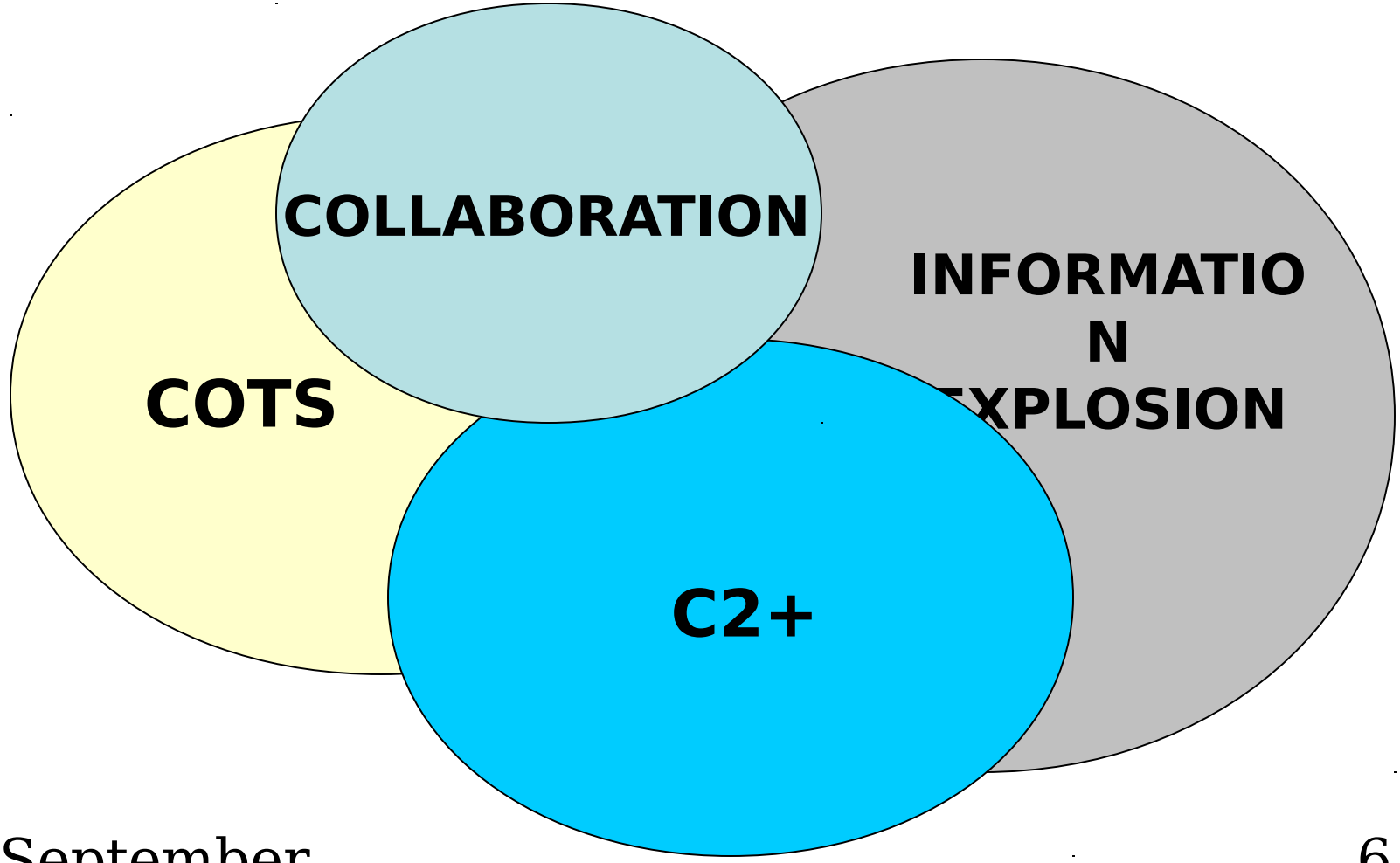
The half-life of this presentation is approximately three months.

Quick IT Test:

Can you answer these five communication questions?

- On the InterNet, what does IM mean?
- What is the fastest cell phone data rate and who accomplished it when?
- Name one advantage to PANs?
- What is the UNP?
- About how many COTS collaboration tools exist today?

Elusive & Evolving Interactions



Today's Agenda

- **C4**: Military Universal (9)
- **Information** Explosion (6)
- **COTS**: Definition, Drivers, Growth (8)
- **Collaboration** Definition, Tools, & Trends (18)
- COTS Collaboration: A Database
- COTS & C4 Likely Future: Flexible Collaboration Networks

Command, Control,
Communications, and
Computers

REAL WORLD: The Problem

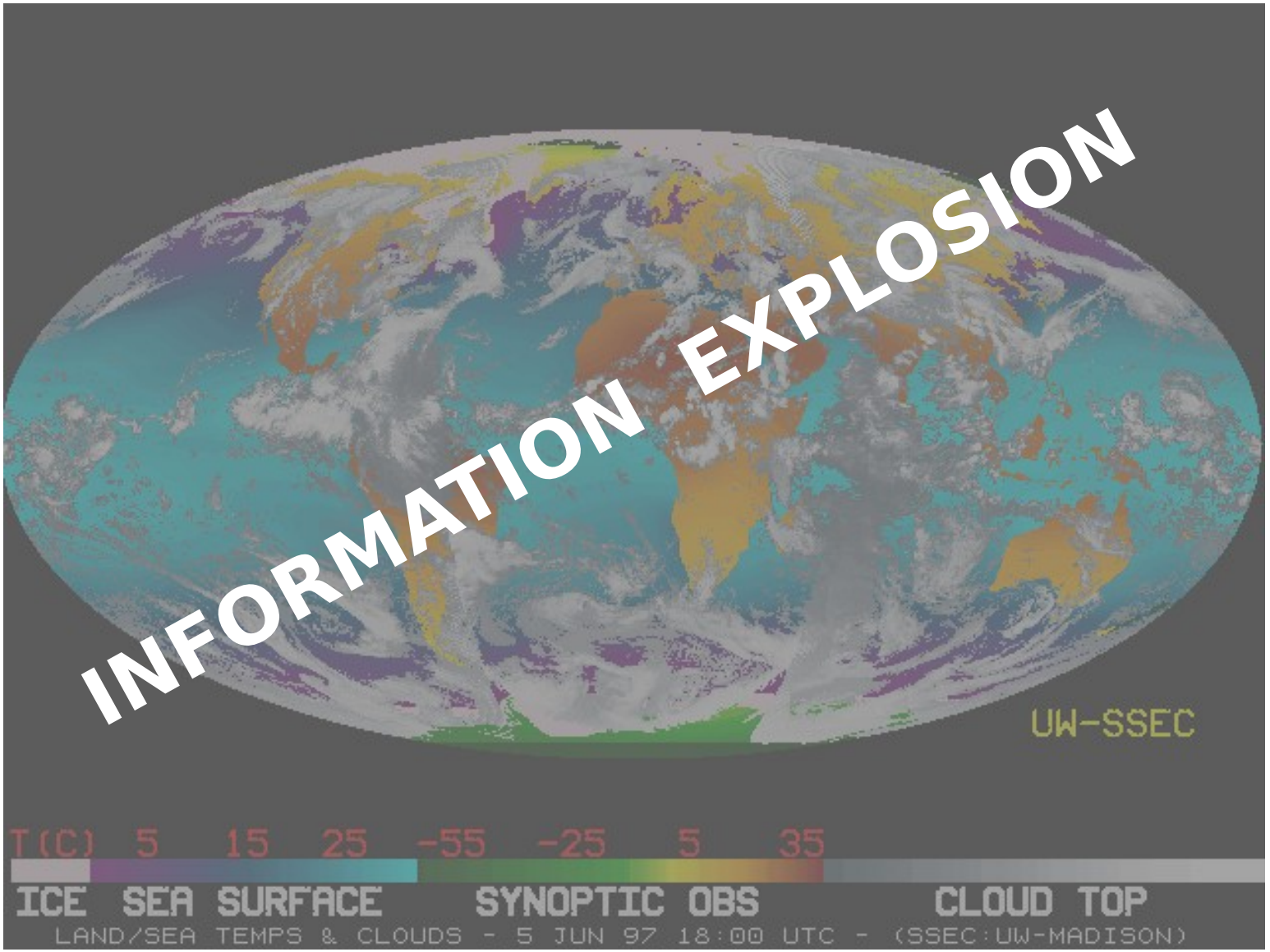
“I assumed the mayor was downtown at the city's new emergency command center, a $15 million bunker constructed on the 23rd floor of one of the smaller buildings in the World Trade Center complex. I didn't know that the building that housed it had already been evacuated. Grabbing a cab downtown, I asked the driver to turn up the radio. On the all-news radio station 1010 WINS, Joan Fleisher, a business-side staffer for the station, was on the line describing the site. The vice president was on the line for Giuliani. The mayor walked into a private office to take the call. He barely got out the words "Mr. Vice President," before the phone went dead. New York was under attack, the White House

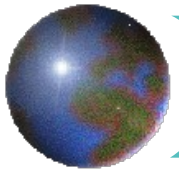
REAL WORLD: The Problem

“Air Force Gen. Richard Myers wasn't in the Pentagon when terrorists attacked it Sept.11, but the event was still a nightmare for him. Watching the events unfold on television was "like watching a bad movie," the current chairman of the Joint Chiefs of Staff told American Forces Radio and Television Service Oct. 17. Myers said he was on Capitol Hill that morning in the offices of Georgia Sen. Max Cleland to discuss his confirmation hearing to become chairman. While in an outer office, he said, he saw a television report that a plane had hit the World Trade Center. They thought it was a small plane or something like that, “Myers said. So the two men went ahead with the office call. Meanwhile, the second World Trade Center tower was hit by another jet. "Nobody informed us of that," Myers said. “But when we came out, that was obvious. Then, right at that time, somebody said the Pentagon had been hit.” Somebody thrust a cell phone in Myers's hand. Gen. Ralph Eberhart, commander of U.S. Space Command and the North American Aerospace Defense Command, was on the other end of the line "talking about what was happening and the action she was going to take.“… His predecessor, Army Gen. Henry Shelton, was "somewhere over the Atlantic" en route to Europe when the attacks

C2: A Systems Universal?

- Quick Question: Where is the largest, most sophisticated command-and-control center in the world?

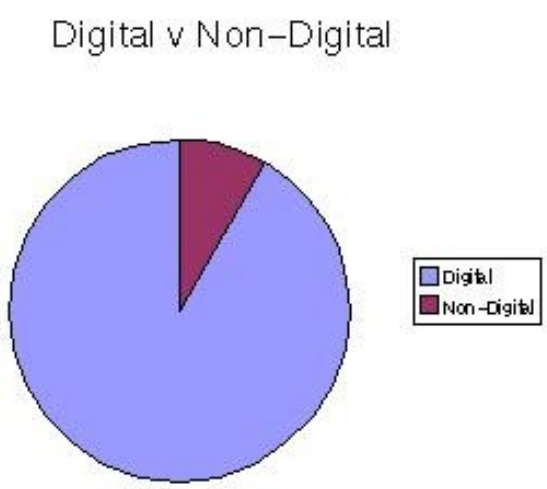

INFORMATION EXPLOSION
UW-SSEC
T(C) 5 15 25 -55 -25 5 35
ICE SEA SURFACE SYNOPTIC OBS CLOUD TOP
LAND/SEA TEMPS & CLOUDS - 5 JUN 97 18:00 UTC - (SSEC:UW-MADISON)



Information & Media Explosion

- Radio = 38 years to reach 50 million people
- TV = 13 years to reach 50 million people
- InterNet = 4 years to reach 50 million
- October 2001 = 476 million InterNet users
- 1993 = 50 pages on the World Wide Web
- 2000 = “2.1 billion unique, publicly available pages”
- > 3,700 world radio and TV stations streaming audio and video
- > 10 million households (35 million screens) = broadband
- “By 2007, more than 60 percent of the U.S. population age 15 to 50 will carry or wear a wireless computing and communications device at least six hours a day.”

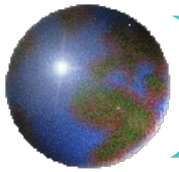
INFORMATION TODAY



"Over 93 percent of the information produced in 1999 was in digital format."

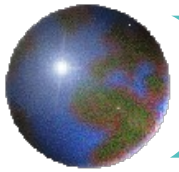
"The world's total yearly production of print, film, optical, and magnetic content would require roughly 1.5 billion (GB) gigabytes of storage. This is the equivalent of 250 megabytes per person for each man, woman, and child on earth."

Source: Lyman & Varian, 2000



Content vs. Connectivity

- “The Internet is widely regarded as primarily a content delivery system. Yet historically, connectivity has mattered much more than content. Even on the Internet, content is not as important as is often claimed, since it is e-mail that is still the true "killer app.“
- “The primacy of connectivity over content explains phenomena that have baffled wireless industry observers, such as the enthusiastic embrace of SMS (Short Message System) and the tepid reception of WAP (Wireless Application Protocol)” (Odlyzko, 2001).



Information: 2001 & Beyond

"During the past 25 years, a wave of technologic and organizational restructuring has been rolling across the world's industrial economies."

- DARPA's 1995 policy shift: The Signal
- Electronic Information Technology:
  - Beyond IM to "integrated messaging" (unified)
  - Learning Organization Technologies: MIT
  - PANs (personal area networks) <source>
  - "Symmetrically-informed transactions"
  - Sprint and Lucent's G3 cell phone <source>

Commercial-off-the-Shelf

“COTS” Study

- DTIC was searched for all unclassified Government documents from the earliest dates, that contained either "COTS" or "commercial off the shelf" and "collabo."
- That search yielded 307 documents meeting those criteria, and were dated from 1954 to July, 2001.
- The first use of “COTS” as intended here was Report ADA166027 in December, 1984.

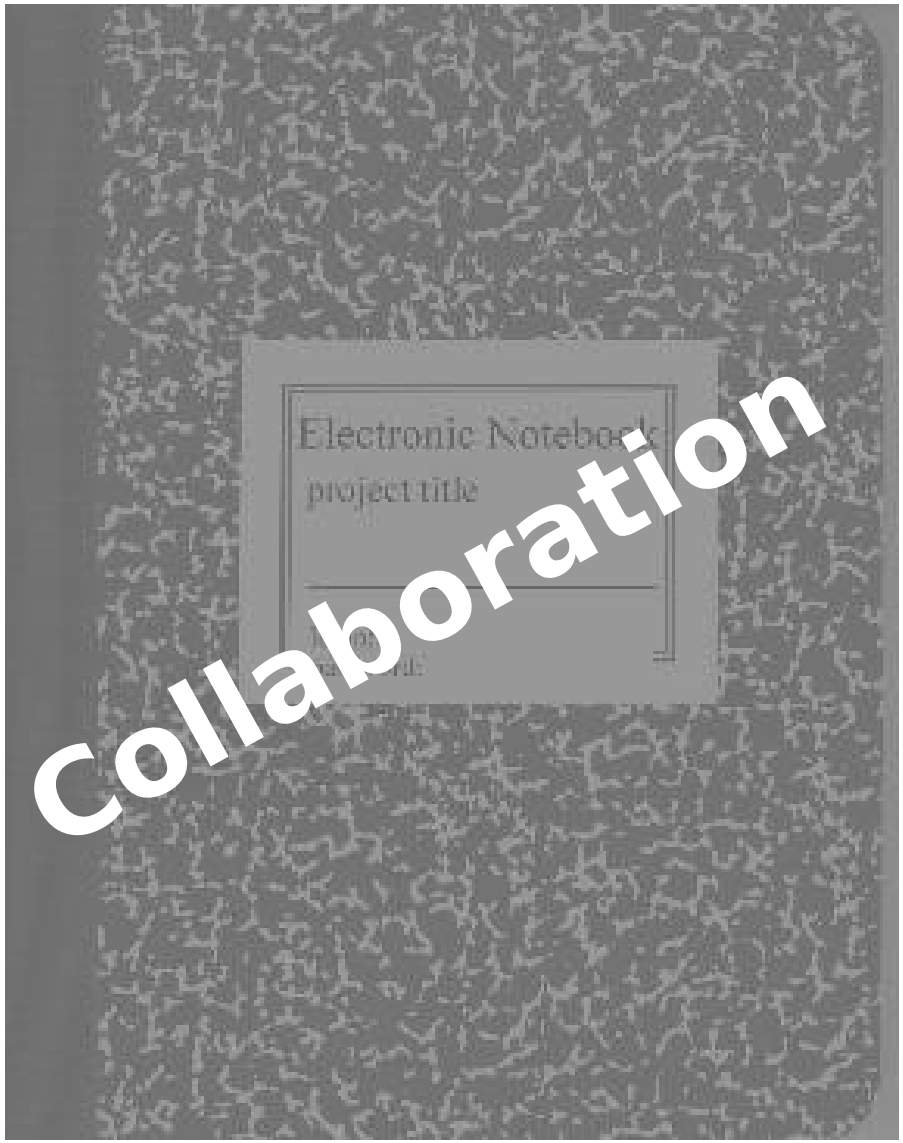
COTS on the "Battlefield"

"The Navy is embracing COTS C4 technology like never before. In February, about 2,000 seagoing officers were outfitted with Palm handheld computers and now use them for scheduling and communications. Commanders can instantly e-mail orders, one at a time or en masse. In June, the submarine USS Dolphin, cruising 400 below the surface of the Pacific, sent the first underwater e-mail from a moving vessel, using software from a Massachusetts contractor." (also BBC News 13 June, 2000)

COTS on the "Battlefield"

TH-1 "Talking Head" Codec for live video & audio on demand via ISDN & Inmarsat satellite.

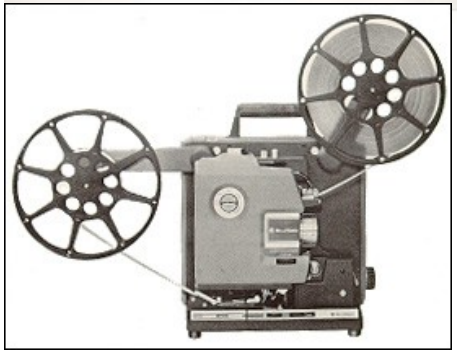
Recall last April, "when a Navy spy plane was forced to land in China. Part of the story was broadcast to viewers all over the world by CNN, who used a video phone to transmit the live images of the crew boarding the chartered jet and then its departure."


Electronic Notebook
project title
Collaboration

Flashback

1980: Do you remember:

- Card Catalogues
- Slide Briefings
- Film Strips
- Audio Cassettes
- Reel to Reel Movie Projectors



COTS: Collaboration Status

- Third Digital Revolution is Here, but…
- Collaboration Paradox:
  - Twenty years ago: phone, e-mail, fax
  - Today: e-mail, phone, fax, cell phone
  - Tomorrow: “Carbon-Silicon Network”
- Collaboration Definition
- The COTS Collaboration Roller Coaster

COTS Collaboration Roller Coaster

- WAP was first developed by Unwired Planet in 1997
- Which became Phone.com
- Phone.com and Software.com merged and are now called Openwave
- Best U.S. sites for WAP information are http://www.ayg.com/ and http://www.allnetdevices.com/

Collaboration Tools: What were they?

Top Ten Internet Collaborative Tools (1998):

1. Email
2. Listservs
3. Newsgroups
4. BBSes
5. Web-Conferencing
6. Internet Relay Chat (IRC)
7. Muds/Moos
8. IPhone and Internet Radio
9. Desktop Video Conferencing
10. VRML Chat Systems

Collaboration: New World Order

The InterNet transformed the world by linking computers to each other; The World Wide Web transformed the world by providing an easy multimedia interface for accessing documents and files on those computers. Today, "something big is happening. Houses are talking to computers. Magazines are talking to wireless phones. Cars are talking to the InterNet. It's already begun….We have entered the era in which things don't just think, but share what they know with each other."

The quote was provided by Motorola, 2001

Collaboration: What is it?

- "Today, over 10% of the U.S. workforce teleworks."
- "The new [work] currency won't be intellectual capital. It will be social capital–the collective value of whom we know and what we'll do for each other."
- Work is a "social" event.

COTS Collaboration Trends

- The Old Way: Lotus Notes or Microsoft Exchange expensive rollouts to hundreds of machines.
- The New Way: “teamware or groupware, intranets, real-time discussion and even peer-to-peer software--generally don't replicate the features of Notes or Exchange. They let companies quickly post collabor-ation software on servers.”

Source: **http://www.internetweek.com/indepth01/indepth092601.htm**

Collaboration: Where it Helps

- According to an April, 2001 Joint Collaboration Workshop:
  - Theater Engagement
  - Effects Based Operations (EBO)
  - Rapid Decision Operations (RDO)
  - Virtual Situation Book
  - Distributed SA
  - PAO Operations, etc.

  - Virtual CT 2001

Source: http://www.dodccrp.org/collaboration_ws/pdf/wg_A.pdf

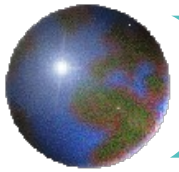
COTS VTC: The Drivers:

After September 11th:

- "Since the tragedy, our business has doubled," Bob Kaphan, president and chief executive of Proximity Video Conferencing
- At Sprint Corp., usage of the company's videoconferencing lines and equipment jumped 40 percent (in the following week)
- At Essex, Mass.-based Affinity VideoNet, the telephone started ringing off the hook just two days after the attacks, said David Carlson, the firm's president and co-owner.

COTS: The Future: IM

- Started long ago (talk fred@fishnet.net)
- IRC created 1988 at University of Oulu, Finland
- AOL initiated IM in 1989
- AOL innovation in 1996 = buddy list
- AOL allows anyone to use software in 1997
- Three methods used to move messages:
  - Centralized, Peer-to-Peer, Combination
- In the workplace (quietly) (Boulton, 2001)
- Zaplets (lessons learned locally)



Peer to Peer: Another Wave

- “When you can add a second 1-GHz CPU to a desktop for $600 instead of getting an additional CPU on an enterprise server for $15,000, that looks pretty good," says Steven Neiman, who heads up high-performance computing for J.P. Morgan Chase.”

- "XML tagging, combined with HTML and the [peer-to-peer] architecture of NXT3, enables you to pull fragments of distributed content together on the fly and create new documents," says task force member Brand Niemann, a computer scientist with the Environmental Protection Agency.”

Source: **http://www.cnn.com/2001/TECH/internet/08/03/p2p.potential.idg/**

DoCoMo

- “Japan's DoCoMo rolled out the world's first 3G service on Oct. 1, testing for the first time what most of the telecommunications industry hopes will revive slumping profits and interest in mobile applications. In addition to handsets with videoconferencing capability, the DoCoMo service also includes a wireless networking card for laptops that offers very quick Web access. Ideally, 3Gnetworks can allow users to download data at 40 times the normal rate for wireless Internet. Test users of DoCoMo's service said the coverage has been spotty and often drops the connection, though it is getting better. DoCoMo President Keiji Tachikawa hopes for six million Freedom of Mobile Multimedia Access users in three years.” (Wall Street Journal, 2 October 2001)

E-Mail Enabled Groupware

- “The "Big-Three" groupware vendors, Microsoft, Novell and Lotus, all supply groupware enabled messaging platforms, which occupy 90% of Fortune 1000s corporate networks. All three products, Lotus Notes Domino, Novell GroupWise and Microsoft Exchange, offer "Unified Messaging" (UM) support and integrate well with a wide array of third party UM products, such as Lucent Technologies Octel Voice Messenger or Optus FacSys Fax Server. The remaining messaging servers, such as NTMail, Eudora WorldMail, MailSite and numerous others, concentrate specifically upon e-mail and message transferring, and do not offer UM support. We therefore define them as "e-mail" servers and not "messaging" or "groupware" servers.”
- “The typical acquisition cost for a 250 user groupware enabled e-mail system is about $12,000 (USD), a straight POP3 e-mail system for 250 users will cost approximately $5,000 (USD).”
- ICQ just rolled out ICQ Groupware in beta. **http://www.icq.com/products/**

Source: **http://www.intranetjournal.com/articles/200001/cl_01_20_00a.html**

PrivatePage On-Premise Paging

- “The messages I sent from my office in San Francisco transmitted to almost 1/2 mile away. Reception will be a little better if you're planning to use PrivatePage in flatter parts of the country. But if your work environment is spread out, you have two available options: increase range with a CB antenna, or add mobility to the base unit via a car adapter. Both devices are available at any electronics store.”
- “Use of this product really couldn’t be easier. With a $170 initial investment and $50 per pager, you own all of the equipment with NO future charges. So, if you can localize your pager needs, PrivatePage is definitely preferable to the hassles you encounter with standard pagers.”

Source: http://telecom.hellodirect.com/docs/Reviews/PrivatePage1.011501.asp

Extreme COTS Collaboration

- Voice Boards
- DoCoMo (i-mode: java enabled phones)
- Streaming PowerPoint
- Peer-to-Peer (brokered grids)
- RoseTel: Advanced Telecommunications Worldwide
- Mobile Display
- Embedded Communication Broker (ECB)

COTS: The Future: Tool Box

- During the past few months a database of 615 (as of 10/10/01) COTS collaboration-related services/tools was built.
- It evolves rapidly.
- Database Features:
  - Fifteen pages of service/tool names
  - Inactive tools/services are not numbered
  - Ninety-nine percent are source hyper-linked
  - One hundred and two percent are annotated with brief sentences about their function

COTS Database Features

As of October 10th:

- 75 page (900KB) Word document
- 665 alphabetized single line items
- 615 “numbered” hyper-linked items *
- 614 descriptive paragraph endnotes
- 131 (21%) “free” items….
- 34 (6%) “unified” items

* Item = COTS collaboration product or service

Selected COTS "Has Been's"

- Ding by Activerse =
- Done.com =
- Juston =
- Launchpad =
- MyInternetDesktop =
- NetForum =
- RoundTable =

Chat, file transfer and messaging options; good security.

First virtual office to integrate web conferencing (via WebEx) into its basic architecture.

Novell discontinued as of January 31, 2001: was an editors choice.

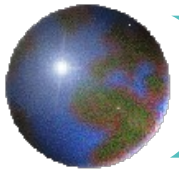
General Dynamics product (now IM part of InfoWorkSpace)

Was nice cross platform office suite

Once popular, went from freeware to commercial to freeware to gone.

Was three window drag & drop

N = 50+



Our COTS Collaborative Future

- DoCoMo
- ECB
- G3
- ICQ
- IM
- IRC
- I-MODE
- MGCP
- P2P
- PAN
- SIP
- SM3
- UNP
- VOIP
- VRML
- WAP

etc.

COTS Lessons Learned

- Most organizations, for the most part, including the military, are in the information business
- Data, information, and people are distributed worldwide, and functionally are topic specific
- Knowledge and wisdom are more “centralized,” and functionally are topic specific
- “Ubiquitous communication acts as a knowledge amplifier,” but needs to be managed
- Work is a social & digital event (the Carbon-Silicon Network)

CONCLUSIONS

- DoD is “behind the curve” about the scope and variety of COTS collaboration tools
- COTS is the future for C4 (much of IT)
- Content is not “king;” collaboration is
- National differences noted in IT focus
- Any useful definition of collaboration is driven by technology, and thus evolves
- You DO NOT want free COTS tools at work
- The military will require robust, stable, secure, and joint/coalition collaboration/IT tools

RECOMMENDATION

To Enable the Information Dominance Transformation

DoD Requires a Joint COTS Collaboration Tool Taskforce (JC2T2)

POC:

A digital copy of presentation (not the database) available upon request:

Contact: George Edw. Seymour, Ph.D.

E-mail: SpaceWalker@spawar.navy.mil

Phone: (DSN or 619) 553-8008

URL: http://www.2-SIR.com/TwinFalls/

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